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NAMRU-3's Bacteriology and Parasitic Disease Research Program

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Since its beginning in 1946, NAMRU-3 has a long history of working with diarrheal disease

By Lt. Cmdr. Stephen Lizewski



I'd like to tell you all about the Bacteriology and Parasitic Disease Program at U.S. Naval Research Unit No. 3 (NAMRU-3).

Since its beginning in 1946, NAMRU-3 has a long history of working with diarrheal disease. An event that solidified NAMRU-3's reputation as a first rate research facility occurred shortly after its inception. A large cholera outbreak in 1947 occurred in Egypt that resulted in more than 20,000 cases and thousands of deaths. During the epidemic, NAMRU-3 scientists developed a treatment

for cholera, saving countless lives. And we have been studying diarrhea ever since, most recently with expats relocating to Cairo and U.S. service members deployed to Operation Bright Star and Djibouti.

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Yes, that means we are some of the very few people on earth that get excited when someone hands them a cup of poop. In recent years, we have conducted field trials of vaccines against some of the most common causes of diarrhea that afflict both traveler's and Department of Defense service personnel while out and about. How do we know what the most common causes of traveler's diarrhea are? We start with basic bacterial culture techniques developed more than 100 years ago. By the way, these techniques are so good that they still form the basis for most microbiology tests in hospitals. For example, if you had a urinary tract infection or a bad case of diarrhea or a staph infection, the laboratory would use these same techniques to tell your doctor what you had and what antibiotics would and would not work.



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Back to our program, we have been improving our testing to better understand the causes of diarrhea and perform assays that few other labs in the world have the capability to conduct. With our location in a very populous Middle Eastern city, we get to see a lot of what makes people sick.



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But studying diarrhea is not all that we do. We have studied many causes of disease over the years, including tuberculosis and sexually transmitted infections. And we've recently started an exciting new collaboration investigating bacteria and a new treatment for bacteria that is resistant to most antibiotics. This treatment uses viruses (called bacteriophages) that infect bacteria, but are completely harmless to humans. We isolate these bacteriophages from dirty water, especially from sewage treatment plants and then test them to see how good they are at killing the bacteria.

As part of our name implies, we also study parasites. The one we have mostly focused on is the parasite that causes malaria. Malaria remains a major problem in many areas of the world, especially in Africa. One of the biggest concerns is that the parasites in Africa will become resistant to the drugs that are used to prevent and treat malaria. This has already happened with the drug chloroquine, which was frequently used to prevent and treat malaria, but is now considered ineffective in Africa—although it can still be used in the Caribbean. Our concern is resistance to the latest drugs, the artemesinins. Our lab tests malarial parasites to see if they develop resistance to artemesinins and other drugs commonly used to treat

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malaria. Our parasitologists can also identify intestinal parasites (back to the poop again) and other blood parasites (like the worms that cause elephantiasis or the parasitic trypanosomes that causes African sleeping sickness).

So why does the Navy care about all these diseases? It has learned hard lessons from what happens when military members are not protected when they deploy to places like Africa or the Middle East. Endemic diseases impact force protection and readiness.

Some prove fatal. That is why scientists like me and the rest of the NAMRU-3 team are out here: to learn about the diseases in Africa and the Middle East and find ways to protect our military members from getting infected. Most of the diseases that we study are called “neglected tropical diseases.” That is because they aren’t found in the U.S. or Europe, either because they never existed there or because they were eliminated. But in

many of the places where our Sailors travel, these diseases are a real threat. The more we know about them, the better we can protect ourselves.



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The NAMRU-3 staff does everything I’ve described above. There are two active duty Navy personnel in the department, myself as the program head and a hospital corpsman laboratory technician. Our Egyptians staff includes one medical doctor, four PhD scientists, lab technologists and technicians. Some of these invaluable staff members have worked at NAMRU for decades.

I hope this gives you an idea of what we do in Cairo, besides visiting the Great Pyramids. This is a very exciting time to be at NAMRU-3 and in Egypt.

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